Amendments to the Claims

Please amend the claims to read as follows:

1. (currently amended) A method for forming microelectromechanical sensors (MEMS), wherein the sensors and the sensor signal processing electronics are monolithically integrated, comprising

(i) firmly connecting a first silicon wafer having cavities formed thereon with a second cap wafer having an epitaxial layer by means of high temperature fusion bonding via the epitaxial layer,

(ii) wherein the wafer composite is reduced from the second wafer towards the epitaxial layer, that is, to a membrane thickness corresponding to the micromechanical portion of the sensor or to a thickness of another portion of the semiconductor wafer responding to mechanical stress, and wherein the wafer composite is finally polished,

(iii) wherein after the polishing process, the electronic sensor structures registered to the cavity ~~(2a)~~ are commonly formed along with the analogous or/and digital circuitries on the polished surface by means of CMOS technology methods.

2. (currently amended) The method of claim 1, characterized in that prior to the wafer bonding process, structures of electronic circuitries ~~(4)~~ are already on that side of the epitaxial layer ~~(3)~~ that faces the cavity after the bonding process.

3. (currently amended) The method ~~according to~~ of 1 ~~and/or 2~~, characterized in that the electronic structures formed on the side facing the cavity at least after the wafer bonding process extend to the polished side to form, for instance, electronically conductive channels ~~(4a)~~.

4. (currently amended) The method of claim 1~~, 2 and/or 3, characterized in that~~ wherein the electronic structures created at the side facing the cavity ~~(2a)~~ comprise

specific sensors in particular for the analysis of the medium located adjacent to the membrane in the cavity.

5. (currently amended) A method for forming a microelectromecanical sensor or system (MEMS), wherein at least one sensor and an associated sensor processing electronic are monolithically integrally formed,

(i) by bonding a first wafer ~~(2)~~ comprising at least one cavity ~~(2a)~~ with a second wafer ~~(1)~~ carrying an epitaxial layer by means of a high temperature fusion bonding process via the epitaxial layer ~~(3)~~ to form a composite of the wafers;

(ii) wherein the composite of the wafers is thinned from the second wafer down to the epitaxial layer ~~(3)~~ and is ~~hereby (~~finally~~)~~ polished;

(iii) wherein after the polishing process at least one sensor structure ~~(5)~~ aligned to the cavity ~~(2a)~~ and at least one analogous or/and digital circuit ~~(4)~~ on the polished surface are formed by means of a CMOS technology method.

6. (currently amended) The method of claim 5, wherein thinning is performed according to a membrane thickness ~~(3a)~~ corresponding to the micromechanical portion of the sensor ~~(5)~~ or according to a thickness of another portion of the semiconductor wafer that is sensitive or responsive to a mechanical stress.

7. (currently amended) The method of claim 5, wherein prior to the wafer bonding process electronic circuits ~~(4)~~ are already formed on or aligned to the side which after the bonding of the wafers ~~(1, 2)~~ faces the cavity or covers the cavity.

8. (currently amended) The method of ~~claims 5 or 7~~ claim 5, wherein the electronic structures formed on the side facing the cavity extend, at least after the wafer bonding process, to the polished side and on particular form electrically conductive channels ~~(4a)~~.

9. (currently amended) The method of claim 5, wherein the electronic structures located at the side facing the cavity ~~(2a)~~ comprise sensors for the analysis of a medium located adjacent to the membrane ~~(3a)~~ in the cavity.

10. (currently amended) A micromechanical sensor or system (MEMS), wherein at least one sensor ~~(5)~~ and associated sensor signal processing electronics ~~(4)~~ are monolithically integrally formed,

(i) by bonding the first wafer ~~(1)~~ comprising at least one cavity to a second wafer ~~(2)~~ carrying an epitaxial layer by means of a high temperature fusion bonding process via the epitaxial layer ~~(3)~~ so as to form a composite of the wafers;

(ii) by reducing the composite of the wafers from the second wafer down to the epitaxial layer ~~(3)~~ and by polishing the same;

(iii) wherein a mechanical sensor structure ~~(5)~~ is aligned to the cavity ~~(2a)~~ and is commonly provided with an analogous or/and digital circuit ~~(4)~~ on the polished surface at least partially in the thinned epitaxial layer ~~(3a)~~, formed prior to or after the polishing process by means of a monolithic integrating technology method.

11. (currently amended) The sensor of claim 10, wherein the thinning is performed to obtain the thickness of a membrane ~~(3a)~~.

12. (currently amended) The sensor of claim 10, wherein the circuit structure ~~(4)~~ is provided prior to or during the bonding.

13. (original) The sensor of claim 10, wherein the technology method is a CMOS technique.

Remarks

Claims 1-13 are pending in the application following entry of this Amendment. Claims 1, 5 and 10 are the only independent claims pending. No new matter is added by the amendments and additions made herein.

Support for the amendments to the claims and specification is found in the original specification as follows.

The claims were amended to remove cross-references to the drawings so as to comport with PTO practice.

With respect to the specification, this amendment corrects an error made in international processing. The amended title is correctly shown in International Publication No. WO 2004/050546 and in the Declaration of Inventorship.

Further, a substitute specification has been submitted to place the application in better form for examination, as in the substitute specification multiple sections of the English translation of the application as originally filed were rearranged or altered to comport with PTO practice.

In paragraph 0001 of the substitute specification, the correct version of the title is as noted.

Paragraph 0002 of the substitute specification is a substantial duplicate of page 1, lines 6-8 of the English translation of the application as originally filed.

Paragraphs 0003 - 0008 of the substitute specification are a substantial duplicate of page 1, line 10 through page 3, line 5 of the English translation of the application as originally filed.

Paragraphs 0009 - 0010 of the substitute specification are a substantial duplicate of page 4, lines 1-6 of the English translation of the application as originally filed.

Paragraphs 0011 - 0019 of the substitute specification are a substantial duplicate of page 1, line 10 through page 3, line 31 of the English translation of the application as originally filed, altered to remove impermissible references to numbered claims.

Paragraphs 0021 - 0033 of the substitute specification are a substantial duplicate of page 4, line 10 through page 6, line 7 of the English translation of the application as